

CITY OF MODESTO STORMWATER SIGNIFICANT RISK RANKING MODEL

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Purpose of the Significant Risk Model

Develop a method to reduce risk to receiving water and improve water quality by quantitatively evaluating the effectiveness of the following controls:

1. BMP
2. Public Outreach
3. Engineering Controls
4. SOPs

Goal

The significant risk ranking model provides a method to evaluate the effectiveness of existing controls and to shift additional resources to risk level 3 and 4 areas.

Calculation of Significant Risk Score

$$\text{Total Significant Risk Score} = (\text{probability}) * (\text{significance}) * \left[\sum (\text{weight factors}) * (\text{Percent Rating}) \right]$$

Application of Significant Risk Score

The significant risk model was applied to the following Program elements as required by 40 CFR 122.34, and identified in the permittee Storm Water Management Plan to determine if additional controls are required for:

- ▣ Illicit Discharges
- ▣ Municipal Program
- ▣ Industrial/Commercial
- ▣ Construction Program
- ▣ Planning and Land Development

Probability

Probability was ranked as 1 through 4 as defined below:

- ▣ Probability 1 = Impact fully mitigated
- ▣ Probability 2 = Impact controlled by procedures and engineering controls
- ▣ Probability 3 = Procedures and inspections have not been fully implemented and there is a history of failure
- ▣ Probability 4 = Aspect is not fully mitigated, impact could have serious consequences

Significance Level

A significance ranking from 1 to 4 was assigned to each aspect based on the occurrence, as listed below:

- ▣ Significance 1 = less than 25% of total occurrence
- ▣ Significance 2 = between 25% and 50% of total occurrence
- ▣ Significance 3 = between 50% and 75% of total occurrence
- ▣ Significance 4 = greater than 75% of total occurrence

Weight Factor

Weight factor was defined as the percentage of the following:

- Hazard = 30%
- Volume = 20%
- BMPs Containment = 10%
- Potential Impact to Water Quality = 10%
- Overall Impact to Environment = 10%
- Impact to Facility or System = 10%
- Impact to Community = 10%

Rating

Rating was defined as 1 through 3

- ▣ Low Impact = 1
- ▣ Moderate impact = 2
- ▣ Significant Impact = 3

Significant Risk Ranking

The risk model allows us to rank potential risk to receiving water and identify potential action items as listed below:

- ▣ Significant Risk 1 = Action item, review BMPs
- ▣ Significant Risk 2= Action item, review BMPs and public outreach
- ▣ Significant Risk 3 = Action items, review BMPs, public outreach, SOPs
- ▣ Significant Risk 4 = Action items, review BMPs, public outreach, engineering controls, and SOPs

Probability Ranking

Probability is ranked from 1 to 4 from not probable to probable.

Not Probable	Slightly Probable	Moderately Probable	Probable
1	2	3	4
<u>Impact fully mitigated:</u>	<u>Impact controlled by procedures and abatement equipment:</u>	<u>Aspect is not frequently inspected or checked:</u>	<u>Aspect is not fully mitigated:</u>
Area is monitored, training is in place, and impact is unlikely due to physical characteristics of the material.	Area inspected, monitored, BMPs are effective, public out-reach has been effective.	Equipment, piping or sewer lines are subject to failure, no public outreach has been ineffective, history of failures.	Impact could have very serious consequences, countermeasures including BMPs, public outreach have not been fully implemented for past failures.

Significance Ranking

Significance is ranked from 1 to 4 based on the frequency of an occurrences, number of events, or number of facilities.

Not Significant	Significant	Moderately Significant	Very Significant
1	2	3	4
<u>< 25% Significant</u>	<u>> 25% < 50% Significant</u>	<u>> 50% < 75% Significant</u>	<u>> 75% Significant</u>
Occurrences less than 25% of the total	Occurrence are between 25% and 50% of the total	Occurrences are between 50% and 75% of the total	Occurrences are greater than 75% of the total

Overall Risk Ranking

Countermeasures			
Significant Score ≤ 350	350 < Significant Score ≤ 500	500 < Significant Score ≤ 650	Significant Score > 650
<u>Risk 1</u>	<u>Risk 2</u>	<u>Risk 3</u>	<u>Risk 4</u>
De Minimums No Action Required	Increase monitoring and documentation required	Increase monitoring and documentation	Increase monitoring and documentation
	BMP Requirement,	Increase frequency of cleaning, modify BMPs	New BMPs required, increase frequency of cleaning
		Additional controls to be evaluated	Additional engineering controls required:
			Design changes maybe required

Example:

Restaurant Significant Score

		Risk Level			Risk Score	Risk Factor
		1	2	3		
Restaurant 53%		No discharge rinse water recovered	Discharge confined to lawns	Rinse water not controlled		
Hazard	30%	Not Hazardous, Low Impact to Water Quality	Hazardous, localized Impact to Water Quality	Hazardous, Significant Impact to Water Quality	60	Risk 4
Volume	20%	≤ 55 gals (460 lbs)	> 55 (460 lbs) ≤ 1000 gals (8340 lbs)	< 1000 gals (8340 lbs)	40	
Containment and BMP	10%	Inside or outside Bldg contained, BMPs effective	Inside Bldg minimal containment, minimal BMPs	Outside Bldg no containment, no BMPs	20	
Potential Impact to Water Quality	10%	Negligible Impact	Moderate Impact	Significant Impact	30	
Impact to Environment	10%	Negligible potential for release	Potential for release but confined onsite	Potential for release off-site	20	
Impact to Bldg or Facility	10%	Negligible impact to Bldg or facility	Potential impact to Bldg or facility	Serious impact to Bldg or facility	10	
Impact to Community	10%	Negligible impact to community	Potential impact to community	Serious impact to community	20	
$1200 = (\text{Probability}) * (\text{Significance}) * [\sum (\text{Risk}) * (\text{Percent})]$					Sum of Risk Factors:	200
					Probability	2
					Significance	3
					(probability) * (significance)	6
					Significant Score:	1200

Calculating Significant Score and Risk

Restaurant 53%		Risk Level	Risk Score
Hazard	30%	2	60
Volume	20%	2	40
Containment and BMP	10%	2	20
Potential Impact to Water Quality	10%	3	30
Impact to Environment	10%	2	20
Impact to Bldg or Facility	10%	1	10
Impact to Community	10%	2	20
Significant Score ≥ 1200 = Risk 4		Total	200
		Probability	2
		Significance	3
		(probability) * (significance)	6
		Significant Score:	1200

Industrial and Commercial Risk Ranking

<u>Municipal Program Potential Impacts Risk and Mitigation</u>	<u>Ranking</u>	<u>Risk Ranking</u>	<u>Action Required</u>	<u>Action Items</u>			
				<u>Are SOP Effective?</u>	<u>Are Current BMPs Effective</u>	<u>Is Public Out Reach Effective</u>	<u>Additional Engineering Controls Required</u>
<u>Restaurants</u>	1200	4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<u>Gasoline Retailers</u>	580	3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Auto Body Shops</u>	520	3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Industrial Facilities</u>	520	3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Auto Repair Shops</u>	500	2	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Equipment Rentals</u>	480	2	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Car Wash</u>	400	2	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Auto Dealers</u>	380	2	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Kennels</u>	360	2	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Nurseries</u>	360	2	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Dry Cleaners</u>	300	1	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Fleet Services</u>	260	1	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<u>Recyclers</u>	260	1	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Analysis of Industrial and Commercial Facilities

Initial focus is on those facilities with a Risk Ranking ≥ 3 that include:

<u>Facility</u>	<u>Risk Ranking</u>
Restaurants	4
Gasoline Retailers	3
Auto Body Shops	3
Industrial Facilities	3

Action Items

Evaluate effectiveness of:

- ▣ Standard Operating Procedures (SOPs)
- ▣ Best Management Practices (BMPs)
- ▣ Public Outreach
- ▣ Engineering Controls

Follow-up

Randomly audit facilities to ensure effectiveness of implemented action items and re-evaluate Risk Ranking to determine if Risk has been reduced.



Questions?